

Claims

Claimed is:

1. A process for the stretching of textile fibers (6), therein characterized, in that at least one fluid (7) is so guided to the fibers to be stretched, that it entrains said fibers (6) and at least exerts a portion of the necessary tensile force thereon to cause stretching.
2. A process in accord with Claim 1, therein characterized, in that at least one fluid (7) is brought to the fibers (6) in such a manner, that, in the velocity scale of the fibers (6) to be stretched, the said fluid (7) entrains the more rapid moving fibers (6).
3. A process in accord with Claim 2, therein characterized, in that the at least one fluid (7) exerts on the fibers (6) an entraining force component in the stretching direction V , so that the possible, present, inter-fiber cohesive forces of the fibers (6) are less than the total entraining tensile forces to which the fibers (6) are subjected.
4. A process in accord with one of the foregoing claims, therein characterized, in that at least one fluid (7) is conducted to the fibers (6) in such a manner, that in the velocity scale of the fibers (6) to be stretched, the said fluid entrains the slower moving fibers (6).
5. A process in accord with Claim 4, therein characterized, in that the at least one fluid (7) exerts on the fibers (6) entraining force components in or counter to the direction of stretching (V).

6. A process in accord with one of the foregoing claims, therein characterized, in that the same fluid (7) is used for the consolidation or the restraining of slower fibers (6) on the one hand, and for the acceleration of the relatively more rapid moving fibers (6) on the other.
7. A process in accord with one of the foregoing claims, therein characterized, in that as a fluid (7) a liquid, a liquid mixture, a gas, a gas mixture or a combination of at least two of the named media is employed, in particular, water, air, or a combination of water and air.
8. A process in accord with one of the foregoing claims, therein characterized, in that at least a portion of the fibers (6) are restrained for the achieving of a velocity scale of the fibers (6) among one another by means of mechanical, pneumatic and/or by electrostatic force action.
9. A process in accord with one of the foregoing claims, therein characterized, in that the stretch chamber (1) is placed in a stretch machine and in that before the stretch chamber (1) a carding apparatus is located, by means of which the carding of the fibers (6) at least partially is undertaken by means of a fluid (7), preferably, this fluid being the same fluid (7) as is employed in the stretch chamber (1).
10. A process in accord with one of the foregoing claims, therein characterized, in that the fibers (6) are fed to the stretch chamber (1) as single fibers, fiber flocks, or as a fiber band.
11. A process in accord with one of the foregoing claims, therein characterized, in that the fluid (7) is introduced into the stretch chamber by means of an injector.

12. A process in accord with one of the foregoing claims, therein characterized, in that the Fluid (6) is circulated in a recycle circuit in or outside of the stretch chamber (1)
13. A process in accord with one of the foregoing claims, therein characterized, in that an additive for the lessening of the cohesion between the fibers (6) is added.
14. A process in accord with one of the foregoing claims, therein characterized, in that the stretch chamber (1) is installed after a spinning apparatus and that the fluid (7) conducted out of the said stretch chamber (1) is employed for the spinning of the fibers (6) in the said spinning apparatus.
15. A process in accord with one of the foregoing claims, therein characterized, in that the fibers (6), upon the use of a liquid fluid (7), are dried at the end of the stretch chamber (1).
16. A process in accord with one of the foregoing claims, therein characterized, in that a control and/or regulating apparatus is installed, which controls or regulates the addition of the fluid (7), in regard to, for instance, flow cross-section, pressure, kind, length of application.
17. An apparatus for the stretching of textile fibers, especially by means of a process in accord with one of the foregoing claims, with a stretch chamber (1) in which fibers (6) are stretched, therein characterized, in that a feed device (11) is provided for the feed of at least one fluid (7) to the transported fibers (6) in the stretch chamber (1), and together with the stretch chamber (1), is built in such a fashion, that the added fluid (7) exerts at the least a portion of the necessary tensile force necessary for the stretching of the fibers (6).

18. An apparatus in accord with Claim 17, therein characterized, in that the stretch chamber (1) exhibits a plurality of stretch chamber sections (2, 3, 4) which become less in diameter in a stepwise, or continuous manner in the direction of stretching (V).
19. An apparatus in accord with one of the foregoing apparatus claims, therein characterized in that, the stretch chamber (1) up to one inlet (9) and up to one outlet (8) for the fibers (6) and if necessary, for the at least one fluid (7) is essentially provided with sealing.
20. An apparatus in accord with one of the foregoing apparatus claims, therein characterized in that a fiber supply container (20) and a transition hood (10) leading from the fiber supply container (20) to the stretch chamber (1) are sealed.
21. An apparatus in accord with one of the foregoing apparatus claims, therein characterized in that at least one injector for the at least one fluid (7) is provided, which, advantageously, opens into the stretch chamber (1).
22. An apparatus in accord with one of the foregoing apparatus claims, therein characterized in that the injector is so constructed and directed, that the fibers (6) are accelerated.
23. An apparatus in accord with one of the foregoing apparatus claims, therein characterized, in that one or a plurality of nozzles charged with the at least one fluid (7) or one or a plurality of diversion vanes (13) receiving said fluid (7) in the stretch chamber (1) are so situated, that at least one fluid (7) receives a flow component in or counter to the stretching direction (V).

24. An apparatus in accord with Claim 23, therein characterized, in that a plurality of nozzles in the stretch chamber (1) are placed about the fibers (6) and/or along the fibers (6).
25. An apparatus in accord with one of the foregoing apparatus claims, therein characterized, in that mechanical, and/or pneumatic and/or electrostatic based devices are provided in order to restrain or consolidate fibers (6) in relation to other fibers (6) during the stretching process.
26. An apparatus in accord with one of the foregoing apparatus claims, characterized by a drying apparatus at the end of the stretch chamber (1) for the drying of the fibers (6) leaving the said stretch chamber (1).
27. An apparatus in accord with one of the foregoing apparatus claims, characterized by a control apparatus or a regulating apparatus for the control or regulating of the stretching of the fibers (6) in the stretch chamber (1).

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